

	Substitute Form PTO-1449 (Modified)	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 14174-070US1	Application No. 10/553,659
	<b>Information Disclosure Statement by Applicant</b> (Use several sheets if necessary)		Applicant Muthiah Manoharan	
			Filing Date April 14, 2006	Group Art Unit 1635

### U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	AA	4,415,732	11/15/1983	Caruthers et al.			
	AB	4,458,066	07/03/1984	Caruthers et al.			
	AC	4,897,355	01/30/1990	Eppstein et al.			
	AD	5,171,678	12/15/1992	Behr et al.			
	AE	5,328,470	07/12/1994	Nabel et al.			
	AF	5,691,316	11/25/1997	Agrawal et al.			
	AG	5,889,136	03/30/1999	Scaringe et al.			
	AH	6,107,094	08/22/2000	Crooke			
	AI	2003/0008818	01/09/2003	Pun et al.			
	AJ	6,509,323	01/21/2003	Davis et al.			

### Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	AK	WO 96/41809	12/27/1996	WIPO				
	AL	WO 91/16024	10/31/1991	WIPO				
	AM	WO 93/24640	12/09/1993	WIPO				
	AN	WO 94/00569	01/06/1994	WIPO				
	AO	WO 96/37194	11/28/1996	WIPO				
	AP	WO 98/39359	09/11/1998	WIPO				
	AQ	WO 00/44895	08/03/2000	WIPO (with English abstract)				
	AR	WO 00/44914	08/03/2000	WIPO				
	AS	WO 01/36646	05/25/2001	WIPO				
	AT	WO 01/75164	10/11/2001	WIPO				
	AU	WO 02/44321	06/06/2002	WIPO				
	AV	WO 2004/080406	09/23/2004	WIPO				

### Other Documents (include Author, Title, Date, and Place of Publication)

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	AW	Amosova et al., "Effect of the 1-(2'-deoxy- $\beta$ -D-ribofuranosyl)-3-nitropyrrole residue on the stability of DNA duplexes and triplexes", Nucleic Acids Research, vol. 25(10):1930-1934 (1997).
	AX	Aoki et al., "Potential tumor-targeting peptide vector of histidylated oligolysine conjugated to a tumor-homing RGD motif", Cancer Gene Therapy, vol. 8(10):783-787 (2001).
	AY	Ausin et al., "Synthesis of Amino- and Guanidino-G-Clamp PNA Monomers", Organic Letters, vol. 4(23):4073-4075 (2002).
	AZ	Berger et al., "Universal bases for hybridization, replication and chain termination", Nucleic Acids Research, vol. 28(15):2911-2914 (2000).
	AAA	Bergstrom et al., "Synthesis, Structure, and Deoxyribonucleic Acid Sequencing with a Universal Nucleoside: 1-(2'-Deoxy- $\beta$ -D-ribofuranosyl)-3-nitropyrrole", J. Am. Chem. Soc., vol. 117:1201-1209 (1995).
	ABB	Brotschi et al., "A Stable DNA Duplex Containing a Non-Hydrogen-Bonding and Non-Shape-Complementary Base Couple: Interstrand Stacking as the Stability Determining Factor", Angew. Chem. Int. Ed. 40(16):3012-3014, 2001.
	ACC	Chaloin et al., "Design of Carrier Peptide-Oligonucleotide Conjugates with Rapid Membrane Translocation and Nuclear Localization Properties", Biochem. And Biophys. Res. Comm., vol. 243:601-608 (1998).
	ADD	Chen et al., "Determination of stereochemistry stability coefficients of amino acid side-chains in an amphipathic $\alpha$ -helix", J. Peptide Res., vol. 59:18-33 (2002).
	AEE	Chen et al., "Gene therapy for brain tumors: Regression of experimental gliomas by adenovirus-mediated gene transfer in vivo", Proc. Natl. Acad. Sci. USA, vol. 91:3054-3057 (1994).
	AFF	Chui et al., "Synthesis of Helix 69 of Escherichia coli 23S rRNA Containing Its Natural Modified Nucleosides, $M^3\psi$ and $\psi$ ", J. Org. Chem., vol. 67:8847-8854 (2002).
	AGG	Chui et al., "Synthesis of a 3-Methyluridine Phosphoramidite to Investigate the Role of Methylation in a Ribosomal RNA Hairpin", Bioorg. & Med. Chem, vol. 10:325-332 (2002).
	AHH	Colledge et al., "Disruption of c-mos causes parthenogenetic development of unfertilized mouse eggs", Nature, vol. 370:65-68 (1994).
	AII	Cormier et al., "Synthesis of hexanucleotide analogues containing diisopropylisilyl internucleotide linkages", Nucleic Acids Research, vol. 16(10):4583-4594 (1988).
	AJJ	Cornut et al., "Application to the de novo design of ideally amphipathic Leu, Lys peptides with hemolytic activity higher than that of melittin", FEBS Letters, vol. 349:29-33 (1994).
	AKK	Crimmins et al., "New Developments in the Enantioselective Synthesis of Cyclopentyl Carbocyclic Nucleosides", Tetrahedron, vol. 54:9229-9272 (1998).
	ALL	Decrossi et al., "The Third Helix of the Antennapedia Homeodomain Translocates through Biological Membranes", J. Biol. Chem., vol. 269(14):10444-10450 (1994).
	AMM	Edge et al., "Synthetic Analogues of Polynucleotides. Part VIII. Analogues of Oligonucleotides containing Carboxymethylthymidine", J.C.S. Perkin I, pp. 1991-1996, February 1972.
	ANN	Elbashir et al., "Functional anatomy of siRNAs for mediating efficient RNAi in Drosophila melanogaster embryo lysate", The EMBO Journal, vol. 20(23):6877-6888 (2001).
	AOO	Elmqvist et al., "VE-Cadherin-Derived Cell-Penetrating Peptide, pVEC, with Carrier Functions", Experimental Cell Research, vol. 269:237-244 (2001).
	APP	Evans et al., "Synthesis of Transition State Analogue Inhibitors for Purine Nucleoside Phosphorylase and N-Riboside Hydrolases", Tetrahedron, vol. 56:3053-3062 (2000).

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	AQQ	Feldner et al., "Enhanced Gene Delivery and Mechanism Studies with a Novel Series of Cationic Lipid Formulations", J. Biol. Chem., vol. 269(4):2550-2561 (1994).
	ARR	Felgner et al., "Lipofection: A Highly Efficient, Lipid-Mediated DNA-Transfection Procedure", Proc. Of the Nat'l. Acad. Of Sci USA, vol. 84:7413-7417 (1987).
	ASS	Filichev et al., "Synthesis of 1'-aza-C-nucleosides from (3R,4R)-4-(hydroxymethyl)pyrrolidin-3-ol", Tetrahedron, vol. 57:9163-9168 (2001).
	ATT	Flanagan et al., "A cytosine analog that confers enhanced potency to antisense oligonucleotides", Proc. Of the Nat'l. Acad. Of Sci USA, vol. 96:3513-3518 (1999).
	AUU	Fukunaga et al., "Liposome Entrapment Enhances the Hypocalcemic Action of Parenterally Administered Calcitonin", Encorinology, vol. 115(2):757-761 (1984).
	AVV	Gante, J., "Azapeptides", Synthesis, pp. 405-413, June 1989.
	AWW	Gao et al., "A Novel Cationic Liposome Reagent for Efficient Transfection of Mammalian Cells", Biochem. And Biophys. Res. Comm., vol. 179(1):280-285 (1991).
	AXX	Gershon et al., "Mode of Formation and Structural Features of DNA-Cationic Liposome Complexes Used for Transfection", Biochem., vol. 32:7143-7151 (1993).
	AYY	Grell et al., "protein Design and Folding: Template Trapping of Self-assembled Helical Bundles", J. Peptide Science, vol. 7:146-151 (2001).
	AZZ	Guckian et al., "Structure and base Pairing Properties of a Replicable Nonpolar Isotere for Deoxyadenosine", J. Org. Chem., vol. 63:9652-9656 (1998).
	AAAA	Hammond et al., "Argonaute2, a Link Between Genetic and Biochemical Analyses of RNAi", Science, vol. 293:1146 (2001).
	ABBB	Hasimoto et al., "Parthenogenetic activation of oocytes in c-mos-deficient mice", Letters to Nature, vol. 370:68 (1994).
	ACCC	Haubner et al., "Glycosylated RGD-Containing Peptides: Tracer for Tumor Targeting and Angiogenesis Imaging with Improved Biokinetics", J. Nuc. Med., vol. 42(2):326 (2001).
	ADDD	Hayakawa et al., "The Allylic Protection Method in Solid-Phase Oligonucleotide Synthesis. An Efficient Preparation of Solid-Anchored DNA Oligomers", J. Amer. Chem. Soc., vol. 112:1691-1696 (1990).
	AEEE	Hernandez et al., "Solid-Supported tert-Alkoxyacylation Reagents for Anchoring of Amines during Solid Phase Organic Synthesis", J. Org. Chem., vol. 62:3153-3157 (1997).
	AFFF	Holmes et al., "Steric inhibition of human immunodeficiency virus type-1 Tat-dependent trans-activation in vitro and in cells by oligonucleotides containing 2'-O-methyl G-clamp ribonucleotide analogues", Nuc. Acids Res., vol. 31(11):2579-2768, 2003.
	AGGG	Holmes et al., "The Synthesis of 2'-O-Methyl G-Clamp Containing Oligonucleotides and Their Inhibition of the HIV-1 Tat-TAR Interaction", Nucleosides, Nucleotides & Nucleic Acids, vol. 22(5-8):1262 (2003).
	AHHH	Iwata et al., "Design and Synthesis of Amphipathic 3 <sub>10</sub> -Helical Peptides and Their Interactions with Phospholipid Bilayers and Ion Channel Formation", J. Biol. Chem., vol. 269(7):4928-4933 (1994).
	AIII	Kawasaki et al., "Uniformly Modified 2'-Deoxy-2'-fluoro Phosphorothioate Oligonucleotides as Nuclease-resistant Antisense Compounds with High Affinity and Specificity for RNA Targets", J. Med. Chem., vol. 36:831-841 (1993).
	AJJJ	Ketting et al., "Dicer functions in RNA interference and in synthesis of small RNA involved in developmental timing in C. elegans", Genes & Dev., vol. 15:2654-2659 (2001).

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	AKKK	Kim et al., "Preparation of Multivesicular Liposomes", Biochimica et Biophysica Acta, vol. 728:339-348 (1983).
	ALLL	Kutyavin et al., "Oligonucleotides Containing 2-Amino-adenine and 2-Thiothymine Act as Selectively Binding Complementary Agents", Biochemistry, vol. 35:11170-11176 (1996).
	AMMM	Lam et al., "A new type of synthetic peptide library for identifying ligand-binding activity", Nature, vol. 354:82 (1991) Lan et al., "Minor Groove Hydration is Critical to the Stability of DNA Duplexes", J. Am. Chem. Soc., vol. 122:6512-6513 (2000).
	ANNN	Tae et al., "Efforts toward Expansion of Genetic Alphabet: Replication of DNA with Three Base Pairs", J. Am. Chem. Soc., vol. 123:7439-7440 (2001).
	AOOO	Limbach et al., "Summary: the modified nucleosides of RNA", Nuc. Acids Res., vol. 22(12):2183-2196 (1994).
	APPP	Liu et al., "Bi-stranded, multisite replication of a base pair between difluorotoluene and adenine: confirmation by 'inverse' sequencing", Chemistry & Biology, vol. 4:919-926 (1997).
	AQQQ	Loakes et al., "The applications of universal DNA base analogues", Nuc. Acids Res., vol. 29(12):2437-2447 (2001).
	ARRR	Lohse et al., "Double duplex invasion by peptide nucleic acid: A general principle for sequence-specific targeting of double-stranded DNA", Proc. Nat'l. Acad. Sci., USA, vol. 96(21):11804-11808 (1999).
	ASSS	Maier et al., "Nuclease Resistance of Oligonucleotides Containing the Tricyclic Cytosine Analogues Phenoxazine and 9-(2-Aminoethoxy)-Phenoxazine ("G-clamp") and Origins of their Nuclease Resistance Properties", Biochem., vol. 41:1323-1327 (2002).
	ATTT	Manoharan, M., "Oligonucleotide Conjugates as Potential Antisense Drugs with Improved Uptake, Biodistribution, Targeted Delivery, and Mechanism of Action", Antisense & Nucleic Acid Drug Dev., vol. 12:103-128 (2002).
	AUUU	Martin et al., "Stereoselective Synthesis of 2'-O-(2-Methoxyethyl)ribonucleosides: Neighboring-group participation of the Methoxyethoxy Group in the Ribosylation Step", Helvetica Chimica Acta, vol. 79:12930 (1996).
	AVVV	Matray et al., "Selective and Stable DNA Base Pairing without Hydrogen Bonds", J. Am. Chem. Soc., vol. 120:6191-6192, 1998.
	AWWW	Mayer et al. "Vesicles of variable sizes produced by a rapid extrusion procedure". Biochimica et Biophysica Acta 858:161-168, 1986.
	AXXX	Mayhew et al. "Characterization of liposomes prepared using a microemulsifier". Biochimica et Biophysica Acta 775:169-174, 1984.
	AYYY	Morales et al. "Importance of terminal base pair hydrogen-bonding in 3'-end proofreading by the klenow fragment of DNA polymerase I". Biochemistry 39:2626-2632, 2000.
	AZZZ	Moran et al. "Difluorotoluene, a nonpolar isostere for Thymine, codes specifically and efficiently for adenine in DNA replication". J. Am. Chem. Soc. 119:2056-2057, 1997.
	AAAAA	McMinn et al. "Efforts toward expansion of the genetic alphabet: DNA polymerase recognition of a highly stable, self-pairing hydrophobic base". J. Am. Chem. Soc. 121:11585-11586, 1999.
	ABBBB	Mi et al. "Characterization of a class of cationic peptides able to facilitate efficient protein transduction in vitro and in vivo". Molecular Therapy 2(4):339, October 2000.
	ACCCC	Mitchell et al. "Polyarginine enters cells more efficiently than other polycationic homopolymers". J. Peptide Res. 56:318-325, 2000.

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	ADDDD	Nabel et al. "Direct Gene Transfer with DNA-liposome complexes in melanoma: expression, biologic activity, and lack of toxicity in humans". PNAS 90:11307-11311, 1993.
	AEEEE	Nabel et al. "Gene Transfer in vivo with DNA-liposome complexes: lack of autoimmunity and gonadal localization". Human Gene Therapy 3:649-656, 1992.
	AFFFF	Nakatani et al. "Recognition of a single quinine bulge by 2-acylamino-1,8-naphthryridine". J. Am. Chem. Soc. 122:2172-2177, 2000.
	AGGGG	Nakatani et al. "Specific binding of 2-amino-1,8naphthryridine into a single guanine bulge as evidenced by photooxidation of GG doublet". Bioorganic & Medicinal Chemistry Letters 11:335-337, 2001.
	AHHHH	Negrete et al. "Deciphering the structural code for proteins: helical propensities in domain classes and statistical multiresidue information in {alpha}-helices". Protein Sci. 7:1368-1379, 1998.
	AIIII	Nykanen et al. "ATP requirements and small interfering RNA structure in the RNA interference pathway". Cell 107:309-321, November 2001.
	AJJJJ	Ogawa et al. "Efforts toward the expansion of the genetic alphabet: information storage and replication with unnatural hydrophobic base pairs". J. Am. Chem. Soc. 122:3274-3287, 2000.
	AKKKK	Ogawa et al. "Rational design of an unnatural base pair with increased kinetic selectivity". J. Am. Chem. Soc. 122:8803-8804, 2000.
	ALLLL	Oliver et al. "Effect of the universal base 3-nitropyrrole on the selectivity of neighboring natural bases". Organic Letters 3(13): 1977-1980, 2001.
	AMMMM	Olson et al. "Preparation of liposomes of defined size distribution by extrusion through polycarbonate membranes". Biochimica et Biophysica Acta 557:9-12, 1979.
	ANNNN	Oppoizer et al. "193. 3-Triethylsilyloxypentadienyllithium, a versatile 1,3-diene- or vinyl ketone-building block". Helvetic Chimica Acta 64(7): 2002-2021, Nbr. 193, 1981.
	AOOOO	Pirung et al. "A Universal, photocleavable DNA case: nitropiperonyl 2'-deoxyriboside". J. Org. Chem. 66:2067-2071, 2001.
	APPPP	Pooga et al. "Cellpenetration by transportan". FASEB J. 12:67-77, 1998.
	AQQQQ	Prakash et al. "Synthesis of 2'-O-[2-[(N,N-Dimethylamino)oxy]ethyl] modified nucleosides and oligonucleotides". J. Org. Chem. 67:357-369, 2002.
	ARRRR	Rajappan et al. "An 8-aminoimidazo[4,5-g]guiazoline carbocyclic nucleoside: a ring-extended analog of 5'-noraristeromycin". Tetrahedron 57:9049-9053, 2001.
	ASSSS	Rajeev et al. "High-affinity peptide nucleic acid oligomers containing tricyclic cytosine analogues". Organic Letters 4(25):4395-4398, 2002.
	ATTTT	Roush et al. "trichothecene degradation studies. 2. Synthesis of [13- <sup>14</sup> C] anguidine". J. Org. Chem. 52:598-603, 1987.
	AUUUU	Simeoni et al. "Insight into the mechanism of the peptide-based gene delivery system MPG: implications for delivery of siRNA into mammalian cells". Nucleic Acids Research 31(11):2717-2724, 2003.
	AVVVV	Strauss et al. "Molecular complementation of a collagen mutation in mammalian cells using yeast artificial chromosomes". The EMBO Journal 11(2):417-422, 1992.
	AWWWW	Stirchak et al. "Uncharged stereoregular nucleic acid analogs: 2. Morpholino nucleoside oligomers with carbamate internucleoside linkages". Nucleic Acid Research 17(15):6129-6141, 1989.

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	AXXXX	Szoka et al. "Procedure for preparation of liposomes with large internal aqueous space and high capture by reverse-phase evaporation". Proc. Natl. Acad. Sci. USA 75(9):4194-4198, September 1978.
	AYYYY	Tona et al. "Synthesis of aminoglucoside-modified oligonucleotides". Organic Letters 2(12):1693-1696, 2000.
	AZZZZ	Verma et al. "Modified oligonucleotides". Annu. Rev. Biochem. 67:99-134, 1998.
	AAAAA	Vives et al. "A truncated HIV-1 tat protein basic domain rapidly translocates through the plasma membrane and accumulates in the cell nucleus". Journal of Biological Chemistry 272(25):16010-16017, 1997.
	ABBBB	Weizman et al. "2,2'-bipyridine ligand: a novel building block for modifying DNA with intra-duplex metal complexes". J. Am. Chem. Soc. 123:3375-3376, 2001.
	ACCCC	Wengel. "Synthesis of 3'-C- and 4'-C-branched oligodeoxynucleotides and the development of locked nucleic acid (LNA)". Acc. Chem. Res. 32:301-310, 1999.
	ADDDD	Wilds et al. "Structural basis for recognition of guanosine by a synthetic tricyclic cytosine analogue: guanidinium g-clamp". Helvetica Chimica Acta 86:966-978, 2003.
	AEEEE	Wu et al. "Efforts toward expansion of the genetic alphabet: optimization of interbase hydrophobic interactions". J. Am. Chem. Soc. 122(32):7621-7632, August 16, 2000.
	AFFFF	Zhou et al. "Lipophilic polylysines mediate efficient DNA transfection in mammalian cells". Biochimica et Biophysica Acta 1065:8-14, 1991.
	AGGGG	Zhou et al. "Targeted delivery of DNA by liposomes and polymers". Journal of Controlled Release 19:269-274, 1992.
	AHHHH	Zimmerman et al. "Model studies directed toward a general triplex DNA recognition scheme: a novel DNA base that binds a CG base-pair in an organic solvent". J. Am. Chem. Soc. 117:10769-10770, 1995.
	AIIII	Zitzmann et al. "Arginine-glycine-aspartic acid (RGD)-peptide binds to both tumor and tumor-endothelial cells in vivo". Cancer Research 62:5139-5143, September 15, 2002.

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